CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 95-234

REVISED WASTE DISCHARGE REQUIREMENTS AND RESCISSION OF WASTE DISCHARGE REQUIREMENTS ORDER NO. 88-146

SHELL OIL COMPANY
MARTINEZ MANUFACTURING COMPLEX
MARTINEZ, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

DISCHARGER AND FACILITY DESCRIPTION

1. Shell Oil Company, hereinafter called the Discharger, owns and operates the Martinez Manufacturing Complex (hereinafter called the Facility) in Contra Costa County as shown in Figure 2. This petroleum refinery occupies an approximately 1000 acre site on the south side of the Carquinez Strait. The refinery was established in 1913 as petroleum product terminal. Refining operations commenced at the site in 1916, and a chemical plant, used for the manufacturing of secondary butyl alcohol, was built in 1931. The refinery currently maintains a crude-run throughput of over 150,000 barrels of oil per day, and manufactures various hydrocarbon products including gasoline, intermediate fuels (jet, diesel, stove, kerosene), industrial fuels, spray oils, lubricants, and asphalts. The Facility also manufactures gasoline additives and catalysts. The refinery has manufactured up to 50 different chemical products in the past; however many of the chemical product areas are currently inactive. Wastes generated from refinery processes have been disposed to various locations around the refinery.

PURPOSE

2. The purpose of this Order is to regulate the Facility's wastewater treatment pond system (Ponds 6, 7, 8, 5C, and 5D), inactive solid waste management units (Unit K, I, H, B, PS, L, YY, M, N, O, W, X, Y, Z', AA, DD, FP, JT, and the PG&E Sludge Terraces).

ORDER STRATEGY

3. The Facility contains several contaminated areas which were caused by spills, leaks, and discharges to land during the Facility's operation. The waste management units listed above, to an extent have been influence by discharges which are not directly attributable to waste management unit leakage. Based on review of several years of Facility investigations and monitoring data; all the waste management units regulated by this order are considered to have discharged. The corrective action implementation requirements for the regulated units is as follows:
   a. The Discharger will monitor each unit's downgradient perimeter for increasing concentration trends of the unit's Constituents of Concern. If the unit is determined by the Board's Executive Officer to be a significant pollution source, corrective action systems at the unit will be required to be installed and operated.
   b. The Discharger will monitor the perimeter of the Facility for Constituents of Concern which are derived from each unit. If established trigger levels (concentration limits) are exceeded at the perimeter, a corrective action system at the perimeter will be required to be installed and operated.

HYDROGEOLOGIC SETTING

4. GEOLOGY:

Geologically, the Martinez Manufacturing Complex is located along the east side of the Briones Hills, and partially on the southern alluvial plain/tidal flats of the Carquinez Strait. The upland areas of the refinery consist of three northwest trending ridges (Crude, Middle, and Vine Hills) which are composed of the Martinez, Meganos, and Domengine Formations. The Martinez Formation is a light colored, thinly bedded sequence of siltstones and fine-grained sandstones. The Meganos Formation has been described as a fissile, dark grey shale, with minor siltstone, and sandy claystone. Numerous fractures, and slickensides were noted in unweathered samples. The Domengine Formation has been described as a light colored, very fine to fine grained, thickly bedded sandstone, with thin claystone interbeds. All of these formations dip approximately 50 degrees to the southwest. Fractures, joints and faults have been mapped in these units at the site.

Younger geologic units at the site include a unit of Older Alluvium which ranges from 30 to 900 feet thick across the site. This unit consists of interbedded clay, silt, and fine to coarse sand with pebbles. The channel deposits within this unit range from a few to tens of feet across.

The youngest units at the site consist of Quaternary sediments. Alluvial material, deposited during the Quaternary at low stands of the sea, is found at the site, as well as bay mud, sand, peat, and clay, deposited by the present day bay/estuary system.

5. HYDROGEOLOGY:

The refinery has been divided into 5 groundwater basins (Figure 3). These basins have been defined by the site topography and refinery groundwater elevation measurements. The Basins are designated, from west to east, as the Crude Hill Groundwater Basin, the West Valley Groundwater Basin, the Central Valley Groundwater Basin, the Reservoir Lakes Groundwater Basin, and the East Valley Groundwater Basin.

The Crude Hill Groundwater Basin is located in the southwest corner of the Facility and borders the City of Martinez. The groundwater occurs within the fill and the Domengine Formation in the Crude Hill Area. Groundwater flows southwest, towards the City of Martinez, and discharges into the Arroyo del Hambre groundwater basin. The average groundwater flow rate for the basin has been estimated to be 0.74 feet per year, with an estimated groundwater flux of 3.8 gallons per minute.

The West Valley Groundwater Basin is located between Middle and Crude Hills. The basin includes the Effluent Treatment Area. The basin is composed of fill, Bay deposits (sand, mud and peat), Younger Alluvium, Older Alluvium, and the Domengine Formation. The groundwater in this basin discharges in the lower Clayton/Ygnacio Valley groundwater basin and flows generally to the north, towards the Effluent Treatment Area, and into the Carquinez Strait. The average groundwater flow rate for the basin has been estimated to be 1.2 feet per year, with an estimated groundwater flux of 2.4 gallons per minute.

The Central Valley Groundwater Basin is located east of Middle Hill and west of the Reservoir lakes Groundwater Basin. Groundwater in this basin discharges into the lower Clayton/Ygnacio Valley groundwater basin and flows to the north, towards the northeastern portion of the Effluent Treatment Area, and into Carquinez Strait. The basin is comprised of fill, Bay deposits, Older Alluvium, and the Domengine and Meganos Formations. The average groundwater flow rate for the basin has been estimated to be 4.9 feet per year, with an estimated groundwater flux of 1.9 gallons per minute.

The Reservoir Lakes Groundwater Basin is located in the central part of the refinery. Groundwater in this basin discharges into the lower Clayton/Ygnacio groundwater basin and generally flows to the north, towards and likely into the Carquinez Strait. This basin is composed principally of the Meganos Formation with minor occurrences of Domengine Formation along the southwest and Martinez Formation along the northeast edges. Older Alluvium and Bay deposits are also found in the northern portion of the basin. The average groundwater flow rate for the basin has been estimated to be 0.26 feet per year, with an

estimated groundwater flux of 0.065 gallons per minute.

The East Valley Groundwater Basin is located along the eastern most side of the Facility. This basin is composed of fill, Bay deposits, Younger Alluvium, and the Martinez Formation. Groundwater in this basin discharges into the lower Clayton/Ygnacio Valley groundwater basin and generally flows north towards Peyton Slough and the Carquinez Strait. The average groundwater flow rate for the basin has been estimated to be 5.3 feet per year, with an estimated groundwater flux of 3.3 gallons per minute.

RELATED ORDERS

6. On September 21, 1988 the Board adopted Waste Discharge Requirements Order No. 88-146. This Order addressed the application of Title 23 California Code of Regulations, Chapter 15 to the Facility's: wastewater treatment ponds, stormwater ponds, and several solid waste management units .

7. On June 17, 1987 the Board adopted Site Cleanup Requirements Order No. 87-070. These Site Cleanup Requirements were issued to direct investigation and remedial actions at numerous petroleum hydrocarbon spill sites at the refinery that were identified during previous investigation at the refinery.

8. On June 20, 1990 the Board adopted Waste Discharge Requirements, Order No. 90-095, NPDES permit No. CA0005789. This Order regulates the discharge of approximately 5 million gallons per day of process waste water and storm water from the Facility.

REGULATED WASTE MANAGEMENT UNITS

9. The Facility contains several unlined waste management units which are subject to the requirements under Chapter 15. The following description of these units is provided below. A detailed description of each unit and the Facility is provided in the attached Staff Report which is made a part of this Order.

ACTIVE PONDS

The waste water treatment ponds system is comprised of five active unlined Class II ponds (Pond 6, Pond 7, Pond 8, Pond 5C, and Pond 5D). The waste water treatment system which includes the ponds is used to treat process oily waste, surface water runoff, and other liquid waste streams that originate at the Facility.

REGULATED SOLID WASTE MANAGEMENT UNITS

10. The Facility contains 17 inactive unlined Class II solid waste management units (SWMUs) which the Discharger actively monitors the groundwater. These units are as follows: Unit K, Unit I, Unit H, Unit B, Unit Ps, Unit L, Unit YY, Unit N, Unit O,Unit W, Unit X, Unit Y, Unit Z', Unit AA, Unit DD, Unit FP, and Unit JT. Two units; Unit M and the former Unit Q are not monitored. An additional unit identified as the PG&E sludge Terraces undergoes quarterly groundwater monitoring.

11. The following inactive SWMU's are subject to the requirements of the California Code of Regulations, Title 23, Chapter 15. The location of each SWMU are illustrated in Figure 4. The findings for each SWMU include a brief description of each unit, and the results from the investigation conducted for the specific unit. Tasks to be completed for each unit are stated in the Provisions of this Order.

a. **Unit K**
Site K is a former oily-water sump area located on the east side of Crude Hill. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

b. **Unit I**
Unit I was used as a collection area for tank and process drainage, and for the disposal of acid, tetraethyl lead, asphalt, oil and tar sludges. The unit's waste contains petroleum hydrocarbons,

metals, and various organic compounds.

c. **Unit H**
Unit H was used for the weathering of oily wastes. The site may also have received acid and lead sludges. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

d. **Unit B**
Unit B was used as a containment area for tank leaks, tank overflows, the disposal of acid sludges, tarry sludges, and asphalt. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

e. **Unit PS**
Unit PS waste is a black tarry substance which varies in thickness from two feet to 18 feet thick. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

f. **UNIT L**
Unit L was used for the disposal of asphalt pitch from the vacuum re-run area. The waste material is tarry, oily pitch, or a fill material impregnated with heavy oil or tar. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

g. **UNIT M**
Unit M was used for the disposal of coke from 1923 to 1930. There are two separate parts of the unit, designated Mn (north) and Ms (south). The unit's waste contains petroleum hydrocarbons, and metals. The unit's waste contains petroleum hydrocarbons, and metals.

h. **UNIT YY**
The unit consists of 4 individual waste areas, each of which is located adjacent to an above ground tank. The unit received sludges from Tanks 8, 9, 10, and 12 through the 1950s. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

i. **UNIT N**
Unit N was used as an oily water sump which received oil-water emulsion tank drainings and surface water runoff between 1921 to 1966. The Discharger reports that sludges or solids were not disposed of in the unit. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

j. **UNIT O**
Unit O was used for the disposal of: construction debris, refuse, Tergol clay (used to filter the lube oil additive Tergol), coke fragments, and fill impregnated with oily and tarry waste. Unit O was also used for drying sludges. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

k. **UNIT Q**
Unit Q was clean closed in 1993, in order to construct a ground flare over the former site. The construction of the ground flare was part of the refinery's Clean Fuels Project; a project which was required in order for the refinery to produce federally and state mandated cleaner burning fuels.

l. **UNIT W**
Unit W was used to burn refuse, tetraethyl lead sludges, acid sludges and unspecified laboratory containers from 1938 through the 1950's. The waste ash was disposed of in the unit. The unit's waste contains metals, and various organic compounds.

m. **UNIT X**
Unit X was used for the disposal of effluent pond sludges, acid sludges, and, tetraethyl lead sludges that were contained at Unit H. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

n. **UNIT Y**
Unit Y was used from 1950 to 1970 for the disposal of tetraethyl lead sludges, oily caustic sludges, caustic soda, and refuse. The unit may also contain acid sludges. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

o. **UNIT Z'**
Unit Z' was used for the disposal of oily sludges, Tergol clay, refuse, Perma-16 filter cake, and calcium sulfonate clays. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

p. **UNIT AA**
Unit AA was used to decant water from a catalyst slurry used in catalytic cracking. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

q. **UNIT DD**
Unit DD was used to dispose of oily sludges, Tergol clay, excavated fill, and construction debris. The unit's waste consists of black slag, pitch, oily tar-like material, Tergol clay and filter paper. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

r. **UNIT FP**
The waste found in Unit FP consists of black tarry oil, oily cinder-like waste, coke, slag, and Tergol clay. The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

s. **UNIT JT**
The waste found in Unit JT consists of Perma 16, fibrous filter cake, filter paper, oily silt, oil soaked straw, coke, slag, and Tergol clay.The unit's waste contains petroleum hydrocarbons, metals, and various organic compounds.

t. **P.G. and E. SLUDGE TERRACES**
Pacific Gas and Electric Company leased property from the Discharger to build a facility for drying water treatment and boiler blowdown sludges. Sampling and analysis of the wastes indicated generally low levels of metals in the waste. Soluble levels of copper (2.5 to 14.4 ppm) appear to have the potential to impact water quality.

STORM WATER SURFACE IMPOUNDMENTS

12. There are 5 surface impoundments at the refinery which are used to manage storm water which is either directly discharged to surface water or is discharged to the waste water treatment system. The waters and the sediment in these ponds were sampled and analyzed as part of a 1987 investigation to determine if there were any surface impoundments at the refinery which contained hazardous waste and as such were subject to the Toxic Pits Cleanup Act (TPCA). The investigation concluded that the below listed stormwater ponds are not subject to TPCA. These surface impoundments are described below and their location is illustrated in Figure 2

a. Upper Lake Slobodnick is located in the central part of the refinery. This pond contains storm water runoff from process areas and tank farms in the central area of the refinery. The water is treated by the waste water treatment system except under severe storm events when it can be directly discharged if it meets NPDES permit limits. The pond was enlarged in 1994 and currently

consists of an northern and southern pond. The pond is also used for secondary containment for above ground petroleum storage tanks.

b. Lower Lake Slobodnick is located directly down stream (north) from upper Lake Slobodnick and east of Unit O. This pond contains storm water runoff from the area directly surrounding the pond. Water from this pond is discharged directly to waters of the State after meeting NPDES discharge limits.

During the corrective action at Unit O contaminated material was removed from the bottom of the pond and placed in Unit O. After the excavation of the contaminated pond material was completed a Claymax liner and 18 inches of clean imported fill was placed on the bottom of the pond.

c. Flare Area Storm Water Holding Pond is located in the southeast portion of the refinery. The pond receives storm water from the eastern portion of the refinery. Water from the pond is directly discharged to waters of the State after meeting NPDES discharge limits.

During the construction of a storage pad above Unit FP, contaminated material was excavated from a portion of the pond bottom and placed in Unit FP. After the excavation of the contaminated material was completed, a clean fill and clean fill/ Bentonite mixture was used to fill the excavation.

d. Vine Hill Storm Water Holding Ponds consist of two contiguous ponds which are located southeast of the Flare Area Pond. The Ponds are located adjacent to and partially overlie Unit DD. The ponds receive storm water from the eastern portion of the refinery. Water from the ponds are directly discharged to waters of the State after meeting NPDES discharge limits.

e. Volatiles Pond is located in the southeastern portion of the Refinery. Water from the pond is directly discharged to waters of the State after meeting NPDES discharge limits. The pond is located south of Unit JT.

ITEM 15 FACILITIES

13. The Regional Board Order No. 88-146 identified in finding 15 (Item 15), eight individual waste water treatment units and the refineries product loading areas as units which have the potential to impact surface and groundwater. The Discharger investigated a total of 27 units, which included the eight Item 15 units and 19 product loading areas. The 27 units are identified in Table 3.

The Discharger submitted the following three reports related to the 27 units: January 30, 1990, Work Plan Investigation Of Item 15 Facilities RWQCB Order 88-146 Provision 8 (A); January 31, 1991,Investigation Of Item 15 Facilities RWQCB Order 88-146 Provision 8 (B); and October 1991, Remedial Response Plan For Item 15 Facilities. The Discharger reported that none of the units were used to impound fluids or solids. Based on the review of the above reports and inspection of each of the 27 units, the 27 identified units are not subject to the requirements of Chapter 15. However, certain units have impacted water quality and soil at the refinery, and have the potential to impact soil and groundwater at the site. Therefore, several units are subject to the requirements of Site Cleanup Requirements Order No. 87-070. Upon the revision of Site Cleanup Requirements Order No. 87-070, the new order will be appropriately updated to reflect the current status of the 27 units.

ABOVEGROUND PETROLEUM STORAGE TANKS

14. The Discharger operates several aboveground petroleum storage tanks at the Facility. The tanks are required to comply with the requirements of Chapter 6.67 Section 25270 of the Health and Safety Code, and with Part 112, Title 40 of the Federal Code of Regulations. In part, the Discharger is required to install and utilize a leak detection system for each regulated tank. The Discharger has proposed to

monitor for aboveground tank leaks using double tank bottoms or groundwater monitoring wells.

DISCHARGES

15. The Facility's regulated units have been determined to be leaking or have leaked. Corrective action measures will be implemented according to the requirements of this Order.

BASIN PLAN

16. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) on December 17, 1986 and amended it on August 19, 1987, July 18, 1989 and December 11, 1991. This Order implements the water quality objectives for the Basin Plan.

BENEFICIAL USES

17. The beneficial uses of Carquinez Strait in the vicinity of the Facility are:
    a. Industrial service supply
    b. Navigation
    c. Contact and non-contact water recreation
    d. Commercial and sport fishing
    e. Wildlife and estuarine habitat
    f. Preservation of rare and endangered species
    g. Fish migration and spawning
    h. Shellfish harvesting

18. The potential beneficial uses of groundwater discharged and mixed with surface waters beyond the northern, eastern, and northwestern perimeters of the Facility include:
    1) Wildlife and estuarine habitat

19. The potential beneficial uses of groundwater bordering the southern perimeter of the Facility, and the Crude Hill Basin (including groundwater that will migrate to the Arroyo del Hambre Basin), include:
    1) Industrial process water and service supply
    2) Agricultural supply
    3) Municipal and Domestic Supply

CALIFORNIA ENVIRONMENTAL QUALITY ACT

20. This action is an Order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the California Environmental Quality Act pursuant to Section 15308, Title 14, California Code of Regulations.

NOTICE AND MEETING

21. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

22. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that, Shell Oil Company and any other persons that currently or in the future own this land or operate this Facility, shall meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and shall also comply with the following:

A. Prohibitions

1. The treatment or storage of waste shall not degrade the quality of any usable ground water.

2. The discharge of wastewater originating from any waste management unit, onto land, into groundwaters or surface waters is prohibited.

3. The discharge of wastes or hazardous materials in a manner which will degrade water quality or adversely affect the beneficial uses of the waters of the State is prohibited.

4. The discharge of hazardous waste at the Facility is prohibited. For the purpose of this Order, the term hazardous waste is as defined in Title 23, Article 2 of Chapter 15.

5. The disposal of any wastes or waste contaminated fill/materials placed into or on top of any solid waste management unit (SWMU) is prohibited.

6. The storage, handling, treatment or disposal of sediments, groundwater, or any waste originating from any waste management unit shall not create a nuisance as defined in Sections 13050(l) and 13050(m) of the California Water Code.

7. Activities associated with subsurface investigations and cleanup which will cause significant adverse migration of pollutants are prohibited.

8. The creation of any new waste management units is prohibited without prior approval by the Regional Board.

9. The Discharger shall not cause the following conditions to exist in waters of the State at any place outside the waste management facility:

    a. Surface Waters

        1. Floating, suspended, or deposited macroscopic particulate matter or foam.

        2. Bottom deposits or aquatic growth.

        3. Alteration of temperature, turbidity, or apparent color beyond natural background levels.

        4. Visible, floating, suspended or deposited oil or other products of petroleum origin.

        5. Toxic or other deleterious substances to be present in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

    b. Groundwater

        1. The groundwater shall not be degraded as a result of the waste disposal operation.

B. Specifications

(ALL WASTE MANAGEMENT UNITS)

1. This Board considers the property owner(s) and Facility operator to have a continuing responsibility for correcting any problems which arise in the future as a result of this waste discharge.

2. The Facility's active and inactive waste management units shall not degrade the beneficial uses of State waters.

3. The Discharger shall maintain foundations capable of supporting the Facility's active and inactive waste management unit's groundwater containment systems, and capable of withstanding hydraulic pressure gradients to prevent failure due to settlement, compression, or uplift.

4. The materials used for containment structures shall have appropriate chemical and physical properties to ensure containment of wastes at all times.

5. The Discharger shall ensure that, the Facility's active and inactive waste management units and the structures which control groundwater and surface water for these units, are constructed and maintained to withstand loads or enable repair from conditions generated during the maximum credible earthquake event critical to the site.

6. The waste management units shall be maintained to preclude failure as a result of potential rapid geologic changes.

7. The Discharger shall maintain all devices or structures, installed in accordance with this Order such that they continue to operate as intended without interruption except as a result of failures which could not have been reasonably foreseen or prevented by the Discharger.

8. If the groundwater outside the Facility's perimeter has been impacted above applicable standards by the Facility, the Discharger shall remediate that groundwater to levels acceptable to the Executive Officer and protective of waters of the State.

9. All engineering and geological submittals shall be prepared under the direct supervision of and certified (stamped) by a registered civil engineer or a certified engineering geologist.

10. The Discharger shall install, maintain in good working order, and operate efficiently any facility, alarm, groundwater extraction system or hydraulic/contaminant migration control system necessary to assure compliance with these Waste Discharge Requirements.

11. The Discharger shall not excavate within or reconfigure any unit without prior approval from the Regional Board Executive Officer.

12. Installation and operation of groundwater remediation systems at any unit shall be implemented where degradation of beneficial uses has occurred, is likely to occur, or the unit is identified as a significant pollution source.

13. The Discharger shall periodically demonstrate that all installed groundwater remedial systems (including, but not limited to; groundwater containment, treatment, and/or extraction systems) are functioning as intended and designed.

14. The Discharger shall install any additional groundwater remediation devices required to fulfill the terms of this Order.

15. The Discharger shall install any additional groundwater and surface water monitoring devices required to fulfill the terms of this Order.

16. The Discharger shall continue to operate any groundwater remedial system as long as it takes to achieve compliance with this Order.

17. Any waste management unit which the Discharger proposes to close shall be closed according to a closure plan prepared according all applicable requirements of Chapter 15, and approved by the Executive Officer.

18. The Discharger shall submit photographic documentation of any soil or groundwater corrective action features installed at the Facility, and of any spill which is required to be reported.

19. The Discharger shall extract SPHs from beneath the Facility including SPHs originating from any unit. Dissolved pollutants shall be removed where concentrations are determined to be a threat to the beneficial uses.

(Effluent Treatment Ponds)

20. There shall be no discharges to a surface impoundment, and any residual liquids and sludges shall be removed expeditiously, if it is determined that a surface impoundment is degrading beneficial uses.

21. The impoundments will be operated such that scouring at points of discharge and by wave action at the water line will not degrade the pond containment features.

22. The pipeline discharge to surface impoundments shall be either equipped with devices, or fail-safe operating procedures, to prevent overfilling. The surface impoundments shall always maintain at least 2 feet of freeboard.

23. The Discharger shall operate the surface impoundments according to a detailed operating and contingency plan, which will include at a minimum, procedures for routine inspection of the surface impoundments, discharge into a pond, discharge out of a pond, contingency measures if problems with the containment structures are found, and notification of agencies.

(SWMUs)

24. Waste shall not be exposed at the surface of any SWMU.

25. The units shall be graded and slope maintained in order to promote lateral runoff of precipitation and to prevent ponding on any portion of the unit. Ponded water which accumulates within the aboveground petroleum tank berms located on top of Units B, PS, H, YY, and Z' shall be drained of ponded water within 48 hours. The Regional Board shall be notified within 24 hours if the ponded water cannot be drained within the 48 hour period. The wetland pond which was created on a portion of Unit X is exempt from the ponding requirements of this specification.

26. The Discharger shall submit a revised Report Of Waste Discharge and corrective action plan for any SWMU (including, but not necessarily limited to; Units PS, H, B, YY , and Z') which is partially covered by an above-ground petroleum storage tank (including piping) which has been determined to have discharged to the unit.

(Aboveground Storage Tanks)

27. All aboveground petroleum storage tanks, subject to Chapter 6.67, §25270 of the Health and Safety Code, shall comply with all provisions of that section and Part 112 of the Federal Code Of Regulations.

Leak Detection Systems: All tanks shall be adequately monitored to assure that petroleum

products will not discharge to surface and subsurface waters of the State. All tanks shall be fitted with leak detection bottoms, leak prevention systems, or with a tank leak detection monitoring system/method approved by the Executive Officer. For tanks without approved leak detection systems, such tanks shall be upgraded with leak detection systems during the next 20 years.

Internal Tank Inspections: All regulated tanks shall have their tank bottoms tested (using API Standard 653 or the most current industry or regulatory approved standard) for integrity and thickness. The inspection time interval shall be no more than 20 years and the interval will be dependant on the likelihood of tank bottom corrosion and the age of the tank. A summary of inspection results shall be reported to the Board annually.

(Stormwater Ponds)

28. The Facility's stormwater ponds shall continue to be regulated under a current NPDES permit.

C. General Monitoring Specifications

1. The Discharger shall operate each waste management unit so as to not cause a degradation of the beneficial uses of State waters.

2. All monitoring wells shall be constructed in a manner that maintains the integrity of the drill hole, prevents cross-contamination of saturated zones, and produces representative groundwater samples from discrete zones within the groundwater zone each well is intended to monitor.

3. All borings for monitoring wells shall be continuously cored, and the core shall be archived. The drill holes shall be logged during drilling under the direct supervision of a registered geologist whose signature appears on the corresponding well log. Logs of monitoring wells shall be filed with the Department of Water Resources. All information used to construct the wells shall be submitted to the Board upon completion of the wells.

4. All soil and groundwater samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All Laboratories shall maintain quality assurance/control records for the Board staff to review.

5. The groundwater sampling and analysis program shall ensure that groundwater quality data are representative of the groundwater in the area which is monitored.

6. The Perimeter Compliance Point for each unit is located along and immediately upgradient from the Facility's perimeter to which the unit discharges. Additionally, the Facility's units are required to be monitored at the unit's immediate downgradient perimeter for determining if the unit is a significant pollution source.

7. A list of Trigger Levels (concentration limits), Constituents of Concern, Monitoring Parameters, and Monitoring Points for each unit's Constituents of Concern, shall be identified in the Self Monitoring and Reporting Program (SM&RP), Appendix I.

   The Monitoring Points for the Perimeter Compliance Point and at each waste management unit shall be submitted by the Discharger and specified in the SM&RP.

8. The Discharger shall monitor for all Constituents of Concern and for each Monitoring Parameter at intervals determined in the SM&RP.

9. In the event of a release of a Constituent Of Concern at a concentration greater than the Trigger

Levels beyond the Perimeter Compliance Point the Discharger shall begin a Corrective Action Program.

10. If it is determined by the Executive Officer, based on groundwater monitoring information, that water quality impairment immediately outside the immediate boundary any waste management unit is not improving, or continues to degrade, the Discharger will be required to submit site specific groundwater corrective action proposals.

11. Corrective Action Determination for Each Unit evaluates the following components:

    a. Constituents of Concern (COCs) are those constituents which are likely to be in a waste management unit or which are likely to be derived from waste constituents, in the event of a release.

    b. Trigger Limits For each perimeter Monitoring Point, the Trigger Limit for each Constituent of Concern shall be listed in the SM&RP. Trigger limits will be based on approved board standards and on limits established by methods approved by the Executive Officer. Trigger Limits for the Crude Hill Groundwater Basin shall be based on Maximum Concentration Limits.

    c. Perimeter Compliance Point. The Monitoring Point along the perimeter of the Facility where compliance with the Trigger Limits must be met.

    d. Monitoring Points For the Perimeter Compliance Point and for each unit, shall be those listed in Appendix I, of the attached SM&RP.

    e. Compliance Period [§2550.6]. The duration of the Compliance Period for any waste management unit is equal to the active life of the unit, including the closure period. If the Discharger's Corrective Action Program (CAP) has not achieved compliance in the vicinity of the Concentration Limit exceedance, by the scheduled end of the Compliance Period, the Compliance Period is automatically extended until the waste management unit has been in continuous compliance for at least three consecutive years [§2550.6(c) of Article 5].

12. Additional Monitoring Points and Actions If the Executive Officer determines the existence of an imminent threat to the beneficial uses of surface or subsurface waters of the State, the Discharger may be required to install additional groundwater monitoring wells and/or undertake corrective action measures.

D. Provisions

1. The Discharger shall comply with all Prohibitions, Specifications, and Provisions of this Order, immediately upon adoption of this Order or as provided below.

2. Technical reports/plans, submitted by the Discharger, in compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports/plans shall consist of a letter report that includes the following:
    a. Identification of any obstacles which may threaten compliance with the schedule;
    b. In the event of non-compliance with any Prohibition, Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order; and,
    c. In the self-monitoring reports, an evaluation of the current groundwater monitoring system and a proposal for modifications as appropriate.

3. For each waste management unit subject to this Order, Trigger Levels shall be established for all COCs. Trigger Levels for specific COCs, which are to be used along the Perimeter Compliance Point are set forth in Table 2. The Discharger is required to establish Trigger Levels at the Perimeter Compliance Point for COCs which do not have Trigger Levels established in Table 2. All Trigger Levels proposed by the Discharger shall be submitted for approval by the Executive Officer.

   The Discharger shall meet the requirements of this provision according to the following schedule.

   a. The Discharger shall submit for approval by the Executive Officer, a list of proposed Monitoring Parameters, Monitoring Points, and Constituents of Concern (COCs) for the Perimeter Compliance Point and for each waste management unit. The approved list will be attached to the SM&RP. The report shall include a scaled map which identifies the Perimeter Compliance Point and all Monitoring Points.
   REPORT DUE: February 1, 1996

   b. For COCs which the Discharger has identified at a particular unit, but there is not at least four quarters of chemical data for the specific COC, the Discharger shall monitor for a minimum of four quarters (one year). A list shall be submitted which identifies COCs which do not have four quarters of data or established Trigger Levels. Methods to establish Trigger Levels for COCs without Trigger Levels, shall also be submitted for review along with the list.
   LIST AND TRIGGER LEVELS METHODS DUE: February 1, 1996

   c. The Discharger shall submit a Final List of Perimeter Compliance Point Trigger Levels, approved by the Executive Officer for each waste management unit's COCs. The list will be attached to the SM&RP.
   REPORT DUE: March 1, 1997

4. The Discharger shall submit to this Board a **SWMU Cover Report** acceptable to the Executive Officer. This report shall include the following components:
   a. Description of the cover/cap for each SWMU, including but, not limited to; slope, permeability, and thickness.
   b. For units which received cover material, identify source of material and extent of contamination found in cover material, if any.
   REPORT DUE: March 20, 1996

5. The Discharger shall submit to this Board a **Groundwater Extraction/Treatment System Report** acceptable to the Executive Officer. This report is required for any perimeter, interior, or future groundwater extraction system or treatment system. The report shall include the following components:
   a. As-Built construction design of each groundwater extraction/treatment system, which includes detailed cross sectional drawings;
   b. An extraction/treatment system operation plan, maintenance plan, and maintenance schedule; for each extraction/treatment system.
   c. System Performance: The Discharger shall periodically demonstrate that all groundwater containment and extraction/treatment systems are containing and extracting all Perimeter Compliance Point groundwater at concentrations greater than the approved Trigger Levels. The system performance evaluation shall include but not necessarily be limited to; an establishment of flow capture zones by modeling, establishment of localized extraction system groundwater gradients by field measurements, pump performance, and presentation of chemical monitoring data, all of which demonstrates containment, capture, and removal of pollutants. The report shall also detail any extraction system influences to

groundwater or surface water levels in marsh/wetlands which are adjacent to any extraction system.

d. Capture Analysis: The Discharger shall evaluate and field demonstrate the capture of groundwater at the Perimeter Compliance Point. For all locations along the Perimeter Compliance Point where there is no groundwater capture and there are no groundwater wells in place and monitored for Trigger Levels, the Discharger shall identify on a map such areas. For all locations along the Perimeter Compliance Point where there is groundwater capture by a non-perimeter extraction system, but there are no wells in place to evaluate the Trigger Levels, the Discharger shall identify such areas on a map. For the identified areas, the Discharger shall submit for Executive Officer approval a workplan and schedule to install groundwater wells and/or groundwater treatment systems.
REPORT DUE: March 1, 1997
PERIODIC SYSTEM PERFORMANCE REPORT DUE: March 1, 1997, thereafter, every year.

6. Pursuant to Specification B.27, the Discharger shall submit report and a time schedule a acceptable to the Executive Officer to install leak detection systems in aboveground tanks which are without an acceptable leak detection system. The report and schedule shall take into account the age of the tank, the interval since the last inspection, the inspection results, and the corrosive nature of the contents of the tank.
REPORT DUE DATE: October 20, 1996

7. The Discharger shall submit a technical report, which includes a detailed map identifying all tanks regulated under Chapter 6.67, §25270 of the Health and Safety Code, and Part 112 of the Federal Code Of Regulations. Secondary containment features for all regulated aboveground petroleum storage tanks shall be identified on the map. Arrows identifying the direction of flow from a regulated tank to the containment area shall be drawn on the map unless the containment consists of berms which immediately surround the tank. Berm containment areas around regulated tanks shall be drawn with heavy dark lines. The Discharger shall evaluate tank discharges considering all possible direction of petroleum flow. Where petroleum product would flow into a stormwater pond, the Discharger shall submit a written description of the potential petroleum flow paths. The Discharger shall document any deficiencies in the regulated tanks secondary containment systems.
REPORT DUE: August 20, 1996

8. The Discharger shall notify this Board of any reportable quantity, (42 gallons or more), of oil or petroleum product spilled or leaked from the facility to any ground surface not protected by a non-permeable barrier. Verbal notification of the spillage shall be within one working day of knowledge of the spill and shall be followed up with a written description of the spill to include: the nature and volume of spillage, total area and/or soil volume affected, location map of spillage, and a before-cleanup and after-cleanup photograph of the spill site.
REPORT DUE: Effective upon adoption of this Order and Within 14 calendar days from occurrence of the spill

9. For all waste management units, the Discharger shall submit to this Board evidence of an **Irrevocable Postclosure Fund** or provide other financial means acceptable to the Executive Officer, to ensure monitoring, maintenance, and any necessary remediation actions are pursuant to Section 2580(f) of Chapter 15. This submittal shall include an outline of the financial assurance mechanism and verification that the fund or other means has been created. Fund or other means value shall be supported by calculations, to be included with this submittal, providing cost estimates for all monitoring, maintenance, and replacement of waste management unit monitoring and cover systems. Additionally, cost estimates must be provided for any anticipated or likely remedial measures required for the unit. The fund or other means value shall be based on the sum of these estimates. The cost estimates and funding of the fund or other means shall be

updated to reflect changes to the monitoring systems as they occur.
INITIAL REPORT DUE DATE: August 20, 1996, and every five years thereafter.

10. The Discharger shall submit a detailed **Post Earthquake Inspection Report** acceptable to the Executive Officer, in the event of any earthquake generating ground shaking of Richter Magnitude 7 or greater at or within 30 miles of the Facility. The report shall describe the containment features, groundwater monitoring, and control facilities potentially impacted by the static and seismic deformations of any waste management unit. Damage to any waste containment facility which may impact State waters must be reported immediately to the Executive Officer.
REPORT DUE: Within 2 weeks of Earthquake

11. The Discharger shall submit a report which identifies all areas where known offsite contamination exists. The Discharger shall include details regarding the areas of known offsite contamination.
REPORT DUE: December 20, 1997

(Waste Management Unit Specific Reports)

12. Active Effluent Treatment Ponds
The Discharger shall submit an Operations Plan to the Board for approval by the Executive Officer which shall include the following information for each pond:
a. Treatment chemicals added to any pond influent or pond waters.
b. Pond containment system maintenance tasks and schedule.
c. Methods for: pond sludge sampling, classification of sludge waste, removal of sludge wastes (including schedule) and disposal of sludge wastes.
PLAN DUE: April 20, 1996

Pond sludges shall be sampled and reported according to the approved Plan, according to the following schedule:
REPORT DUE June 20, 1996 and every five years thereafter

13. The Discharger shall conduct quarterly monitoring of the influent to each unlined effluent treatment pond for a period of one year. The Discharger shall propose an influent constituent monitoring list and a sampling period for each pond.
LIST DUE: February 20, 1996
INFLUENT MONITORING REPORTS DUE: Semiannually

Closed Effluent Treatment Ponds 1, 2, 3, 4, 5A and 5B

14. The Discharger shall submit As-Built construction design plans for the area formerly occupied by the closed ponds.
REPORT DUE: July 20, 1996

15. The Discharger shall submit an Operations and Maintenance Plan for the closed pond area.
REPORT DUE: July 20, 1996

16. The Discharger shall submit Revised As-Built construction design and Operations and Maintenance plan if in the future significant modifications or additional construction is conducted at the site which has the potential to impact pond containment features.
REPORT DUE: within 90 days of completion of construction

Unit PS

17. The Discharger shall submit an organic lead statistical data evaluation report, acceptable to the Executive Officer which shall include the following:
a. Detailed statistical evaluation using all available raw data.
b. Graphical plots/distribution of data.

c. Isopach map for the unit's organic lead concentrations.
REPORT DUE: February 20, 1996

18. The Discharger shall submit a report acceptable to the Executive Officer, which shall address offsite Unit PS waste which is located on East Bay Regional Park District Land. The report shall include the following:
    a. The extent and characteristics of waste.
    b. Proposed remedial option which is acceptable to the East Bay Regional Park District, and the Bay Conservation and Development Commission as appropriate due to jurisdictional authority.
    c. A schedule to implement the proposed remedial option.
    REPORT DUE: June 20, 1996

19. The Discharger shall submit a report acceptable to the Executive Officer, which shall evaluate separate phase hydrocarbons found beneath the unit. The report shall describe potential sources including, but not necessarily limited to, below ground petroleum pipelines, aboveground tanks, sewer lines, and upgradinet plumes. The report shall summarize any historical investigations, pipeline pressure tests, and repairs performed to any source or potential source. The report shall also describe current SPH remedial activities within and adjacent to the unit.
    REPORT DUE: June 20, 1996

Unit L

20. The Discharger shall provide a detailed plan which describes Unit L features and operational methods used at the unit in order to prevent soil, groundwater, and surface water contamination due to fire fighting training activities which are conducted on top of the unit.
    REPORT DUE: June 20, 1996

Unit N

21. The Discharger shall include in the Unit N monitoring program, the monitoring of lithium, and mercury.

Unit W

22. The Discharger shall submit technical verification that all groundwater flowing beneath the unit is moving toward the Unit X perimeter extraction trench.
    REPORT DUE: March 1, 1996, thereafter annually.

Unit X

23 The Discharger shall include the monitoring of Well 63 in the units' monitoring program.

24. The Discharger shall submit as part of their groundwater extraction system performance evaluation, constituent monitoring of wells positioned downgradient from the groundwater extraction system. A groundwater monitoring proposal detailing compliance with this provision shall be submitted by the Discharger for approval by the Executive Officer.
    MONITORING PROPOSAL DUE: March 20, 1996
    IMPLEMENTATION OF MONITORING: April 20, 1996

Unit Y

25. The Discharger shall submit as part of their groundwater extraction system performance evaluation, constituent monitoring of wells positioned downgradient from the groundwater extraction system. A groundwater monitoring proposal detailing compliance with this provision shall be submitted for approval by the Executive Officer.
    MONITORING PROPOSAL DUE: March 20, 1996
    IMPLEMENTATION OF MONITORING: April 20, 1996

Unit DD

26. The Discharger shall submit a technical report acceptable to the Executive Officer, evaluating the static and seismic stability of the unit's current configuration. If the analytical results indicated that the unit is unstable, the Discharger shall submit a plan and schedule to stabilize the unit.
REPORT DUE: March 20, 1996.
STABILIZATION PLAN: June 20, 1996

27. The Discharger shall include in the Unit DD monitoring program, the monitoring of manganese.

Unit FP

28. The Discharger shall submit a technical report acceptable to the Executive Officer which assesses the impacts the unit is having on the following:
a. Discharges to the Flare Pond.
b. Influence the unit's groundwater extraction trench is having on the Flare Pond.
c. Influence the contaminated mounded groundwater beneath the unit is having on upgradient and downgradient monitoring wells. Particularly Wells 628 and 627.
REPORT DUE July 20, 1996

Unit JT

29. The Discharger shall submit an organic lead statistical data evaluation report, acceptable to the Executive Officer which shall include the following:
a. Detailed statistical evaluation using all available raw data.
b. graphical plots/distribution of data and support for all statistical assumption.
c. Isopach map for the unit's organic lead concentrations.
REPORT DUE: December 20, 1996

(Notifications to the Board)

30. If the Discharger is delayed, interrupted or prevented from meeting one or more of the time schedules in this Order due to circumstances beyond their reasonable control, the Discharger shall promptly notify the Executive Officer. In the event of such delays, the Board will consider modification of the time schedules established in this Order.

31. If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited, or probably will be discharged in or on any waters of the state, the Discharger shall report such discharge to the following:
(1) This Regional Board at (510) 286-1255 on weekdays during office hours from 8 a.m. to 5 p.m.; and,
(2) The Office of Emergency Services at (800) 852-7550.

A written report shall be filed with the Regional Board within five working days and shall contain information relative to the following:
(1) The nature of waste or pollutant;
(2) The quantity involved and the duration of incident;
(3) The cause of the spill;
(4) The estimated size of affected area;
(5) The corrective measures that have been taken or planned, and a schedule of these measures; and,
(6) The persons/agencies notified.

32. The Discharger shall immediately notify the Board upon determining the possible presence of any wastes outside the perimeter of the Facility. This includes the discovery of any previously unidentified historical waste management units. A work plan, acceptable to the Executive Officer of the Board, shall be submitted to the Board within 30 days of the notification. This work plan shall define the work necessary to characterize the extent and nature of the waste as well as any

impacts from the waste on soil, bedrock, and surface and groundwater.
NOTIFICATION: 96 hours
WORK PLAN DUE DATE: Within 60 days of notification

33. The Discharger shall immediately notify the Board of any flooding, equipment failure, groundwater extraction system failure, slope failure, or other change in unit conditions which could impair the integrity of waste containment facilities or precipitation and drainage control structures.
NOTIFICATION: 96 hours
WORK PLAN DUE DATE: Within 30 days after the incident

34. The Discharger shall file with this Board a report of any material change or proposed change in the character, location, or quantity of this waste discharge. For the purpose of these requirements, this includes any proposed change in the boundaries, contours, or ownership of any disposal area.

(General Provisions)

35. The Discharger shall comply with the SM&RP which is attached to and made part of this order and/or any amendments thereafter.

36. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation of this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. (Refer to Standard Provisions referenced above). The request must contain the requesting entity's full legal name, the address and telephone number of the persons responsible for contract with the Board and a statement. The statement shall comply with the signatory paragraph described in Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code.

37. At any time, the Discharger may file a written request [including appropriate supporting documents] with the Regional Board Executive Officer, proposing appropriate modifications to the Self Monitoring and Reporting Program.
REPORT DUE DATE: Within two months of realizing, or of being notified by the Regional Board Executive Officer, that a change is appropriate.

38. The Discharger shall permit the Board, or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
    a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which may be relevant to the Order.
    b. Access to copy any records required to be kept under the terms and conditions of this Order.
    c. Inspection of any monitoring equipment of methodology implemented in response to this Order.
    d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.

39. Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, submitted by the Discharger, shall also be provided to the following agencies:
    (1) Department of Toxic Substances Control; and,
    (2) United States Environmental Protection Agency

40. The Discharger shall implement any Self Monitoring and Reporting Program issued by the Executive Officer. The purpose of the SM&RP is to detect, at the earliest opportunity, any unauthorized discharge of waste constituents from any waste management unit, or any unreasonable impairment of beneficial uses associated with the Facility's past and present activities.

41. These requirements do not authorize commission of any act causing injury to the property of another or of the public; do not convey any property rights; do not remove liability under federal, state, or local laws; and do not authorize the discharge of wastes without appropriate permits from other agencies or organizations.

42. Regional Board Waste Discharge Requirement Order Number 88-146 is hereby rescinded.

43. The Discharger shall maintain a copy of this Order at the Facility so as to be available at all times to Facility operating personnel.

44. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations, policies, or guidelines; changes in the Board's Basin Plan; or changes in the discharge characteristics.

I, Loretta K. Barsamian, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on December 13, 1995 .

Loretta K. Barsamian

Loretta K. Barsamian,
Executive Officer

Attachments:

Table 1	Summary of Reporting Provisions
Figure 1	Site Location Map
Figure 2	Facility Map and Stormwater Pond Locations
Figure 3	Groundwater Basin Map
Figure 4	Waste unit Location Map
Figure 5	Effluent Treatment Pond Map

Appendix I — Self Monitoring & Reporting Program
Table 2: Trigger Limits For Certain Constituents of Concern For Perimeter Waste Management Units

Attachment 1 — Staff Report

PROVISION REPORT SUMMARY

TABLE 1

Provision Number	Task Summary	Due Date	* Date Received	* Approval Date
3 3.a 3.b 3.c	Groundwater monitoring List of M.P.s, wells, COCs List additional COCs List of Trigger Levels	quarterly 02/01/96 02/01/96 03/01/97		
4	Cover report	03/20/96		
5	Extraction system report System performance	03/1/97 03/1/97 **		
6	AGT schedule	10/20/96		
7	AGT tank report	08/20/96		
8	Spill Report-report within...	14 days		
9	Post closure fund	8/20/96***		
10	Earthquake inspection report within	2 weeks		
11	Offsite Contamination Report	12/20/97		
12	Pond operation plan Pond sludge sampling	04/20/96 06/20/96***		
13	Pond influent monitoring list Monitoring reports	02/20/96 semiannually		
14	Close ponds As-Builts	07/20/96		
15	Closed ponds O & M plan	07/20/96		
16	Revised As-Builts within	90 days		
17	Unit PS organic lead report	02/20/96		
18	Unit PS offsite waste report	06/20/96		
19	Unit PS SPH report	06/20/96		
20	Unit L fire fighting report	06/20/96		
22	Unit W groundwater report	03/01/96**		
24	Unit X offsite well proposal Unit X monitoring implementation	03/20/96 04/20/96		
25	Unit Y offsite well proposal Unit Y monitoring implementation	03/20/96 04/20/96		
26	Unit DD stability report Unit DD stabilization plan	03/20/96 06/20/96		
28	Unit FP impacts	7/20/96		
29	Unit JT organic lead report	12/20/96		

* To be completed by Board staff
** Thereafter submit annually
***Thereafter submit every five years

PROJECT LOCATION

FIGURE 4-1

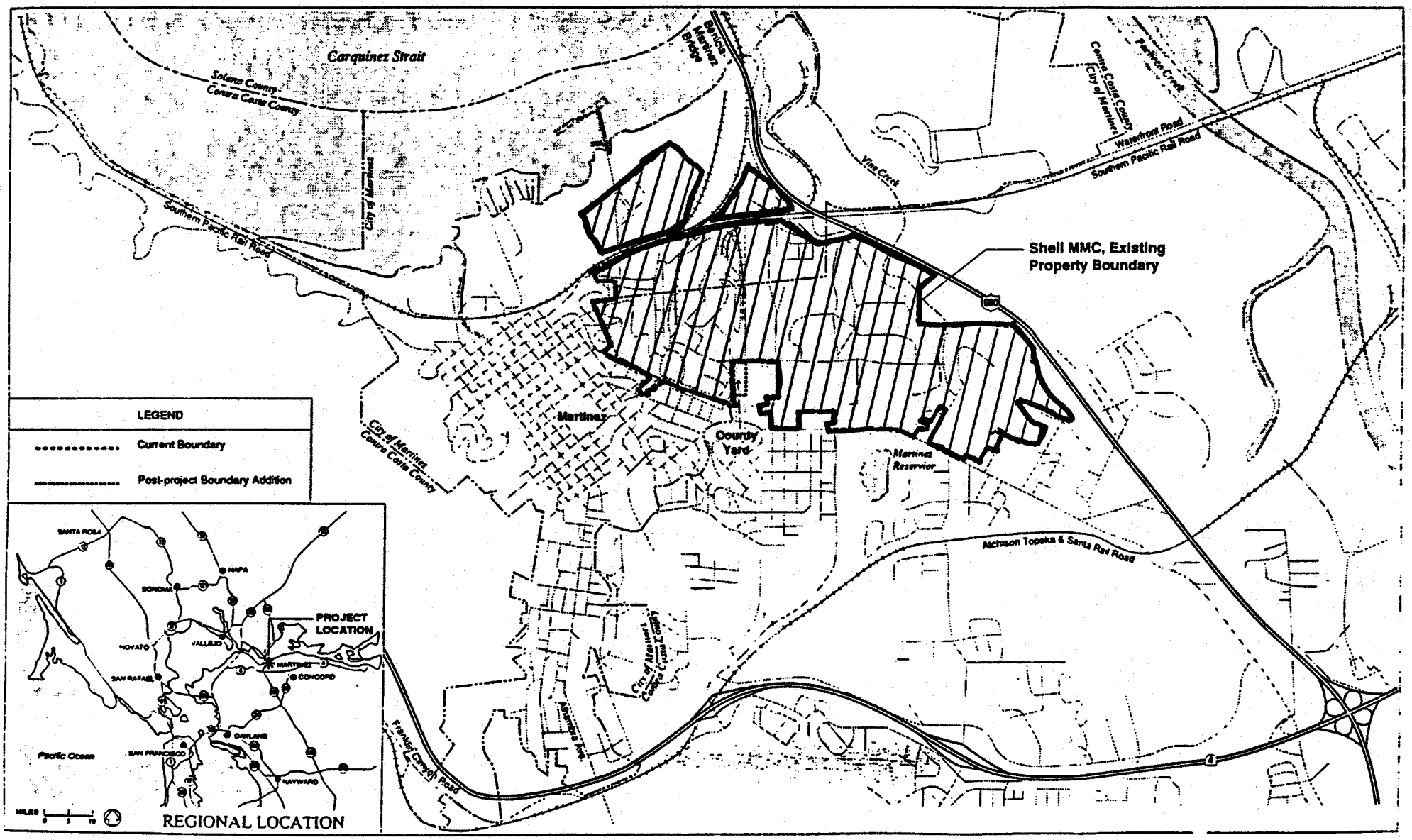

FIGURE 1
LOCATION MAP

FIGURE 7-1

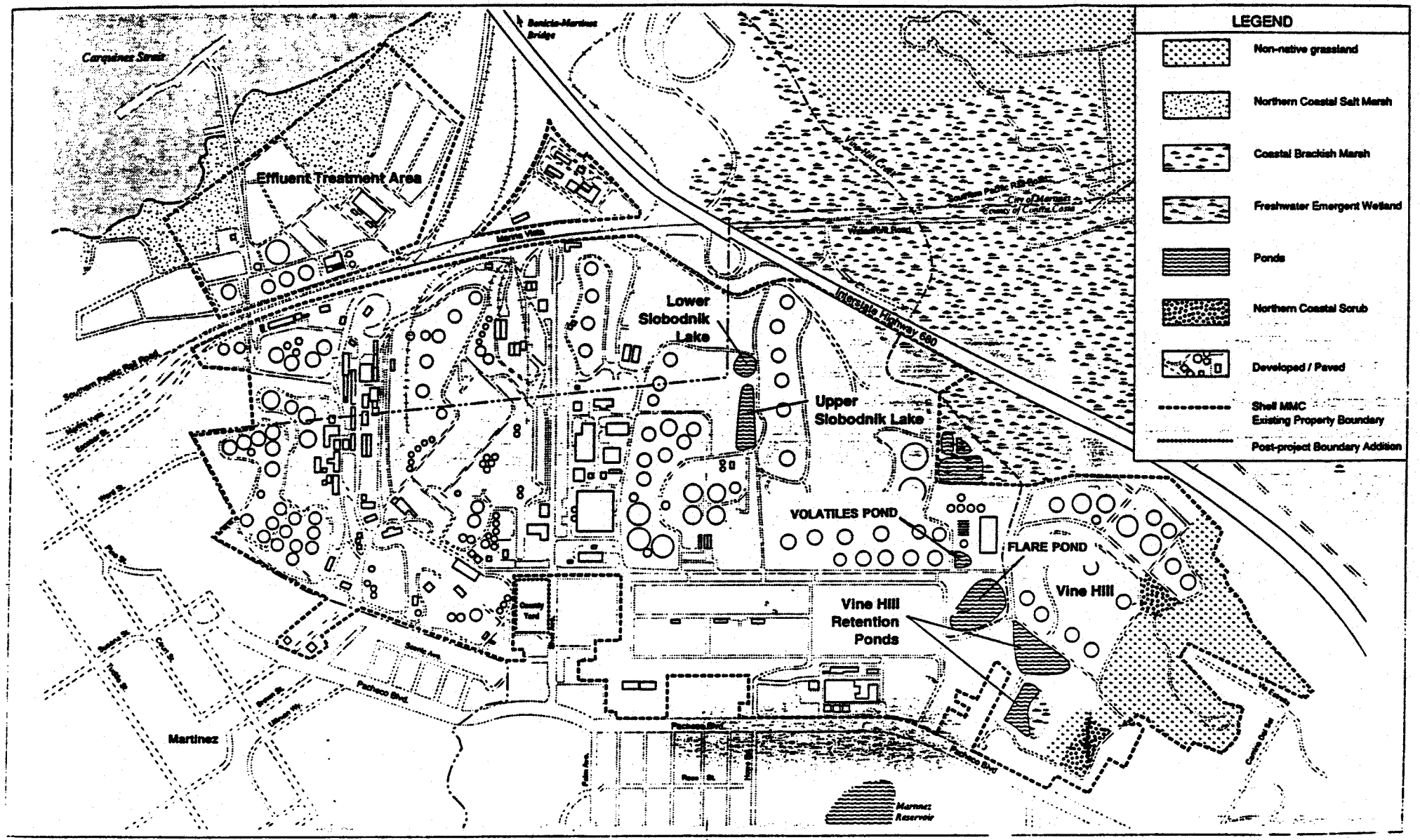

FIGURE 2
FACILITY MAP AND STORMWATER POND LOCATIONS

MARTINEZ MANUFACTURING COMPLEX GROUNDWATER BASINS

FIGURE 6-1

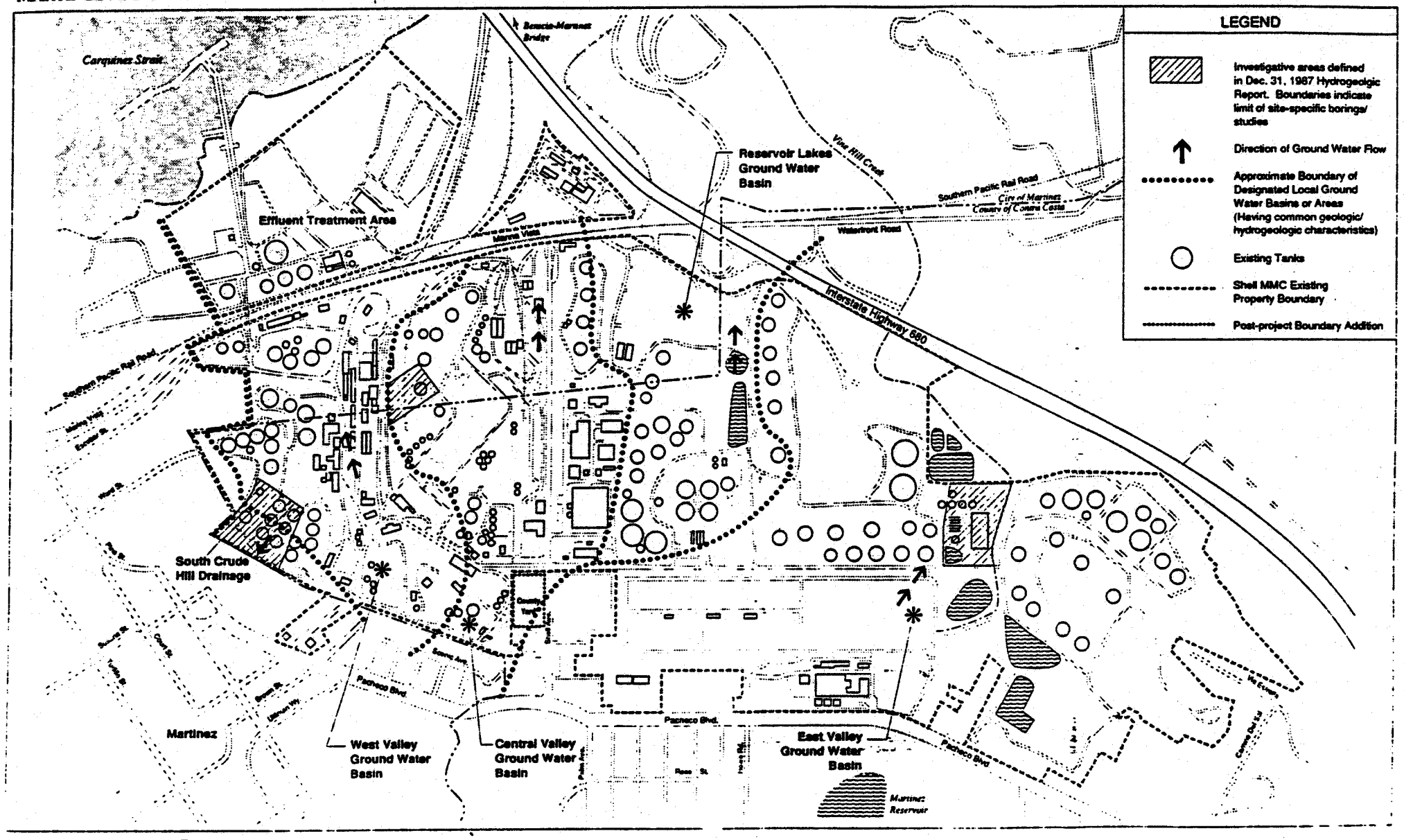

FIGURE 3
GROUNDWATER BASIN MAP

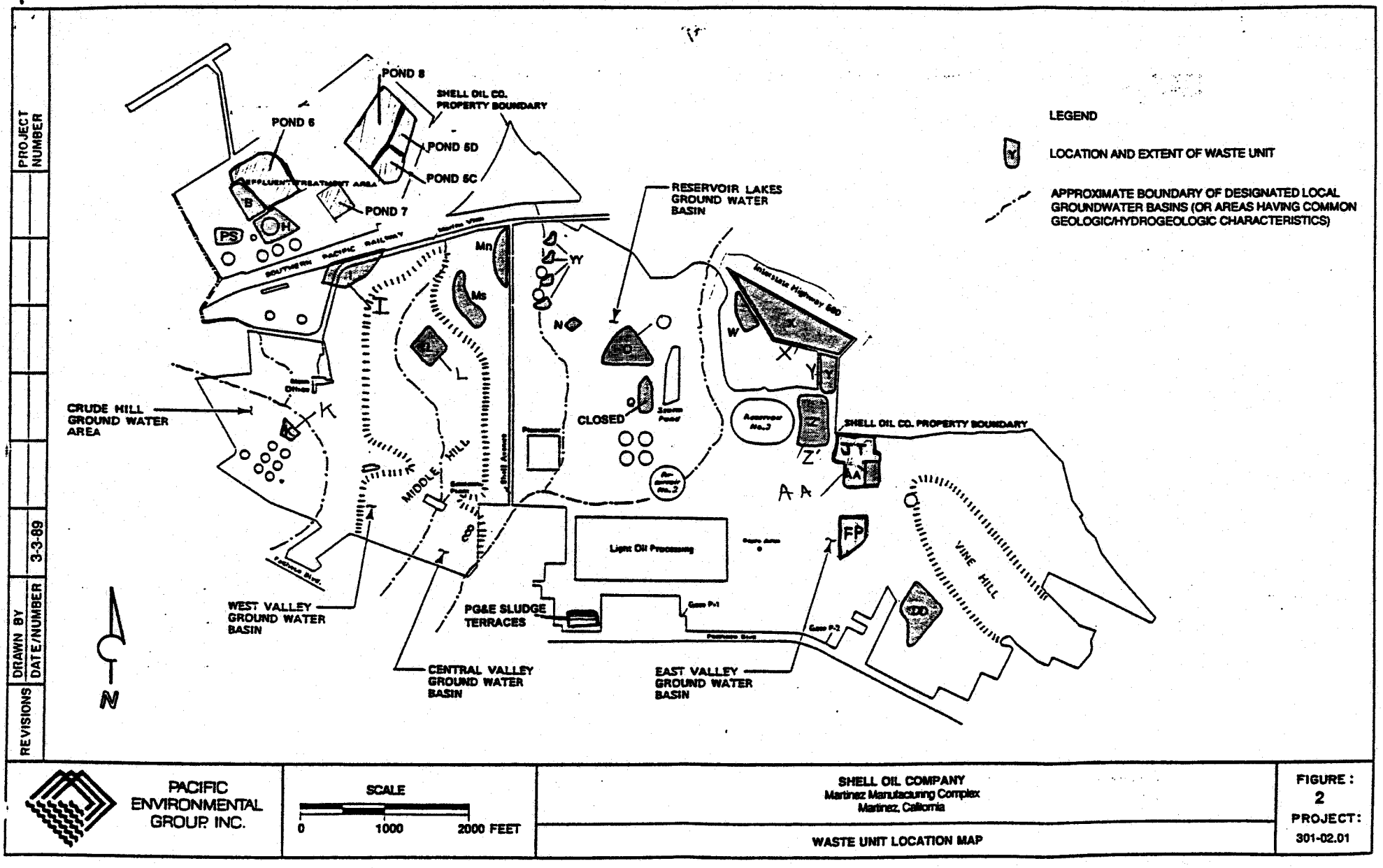

FIGURE 4
WASTE UNIT LOCATION MAP

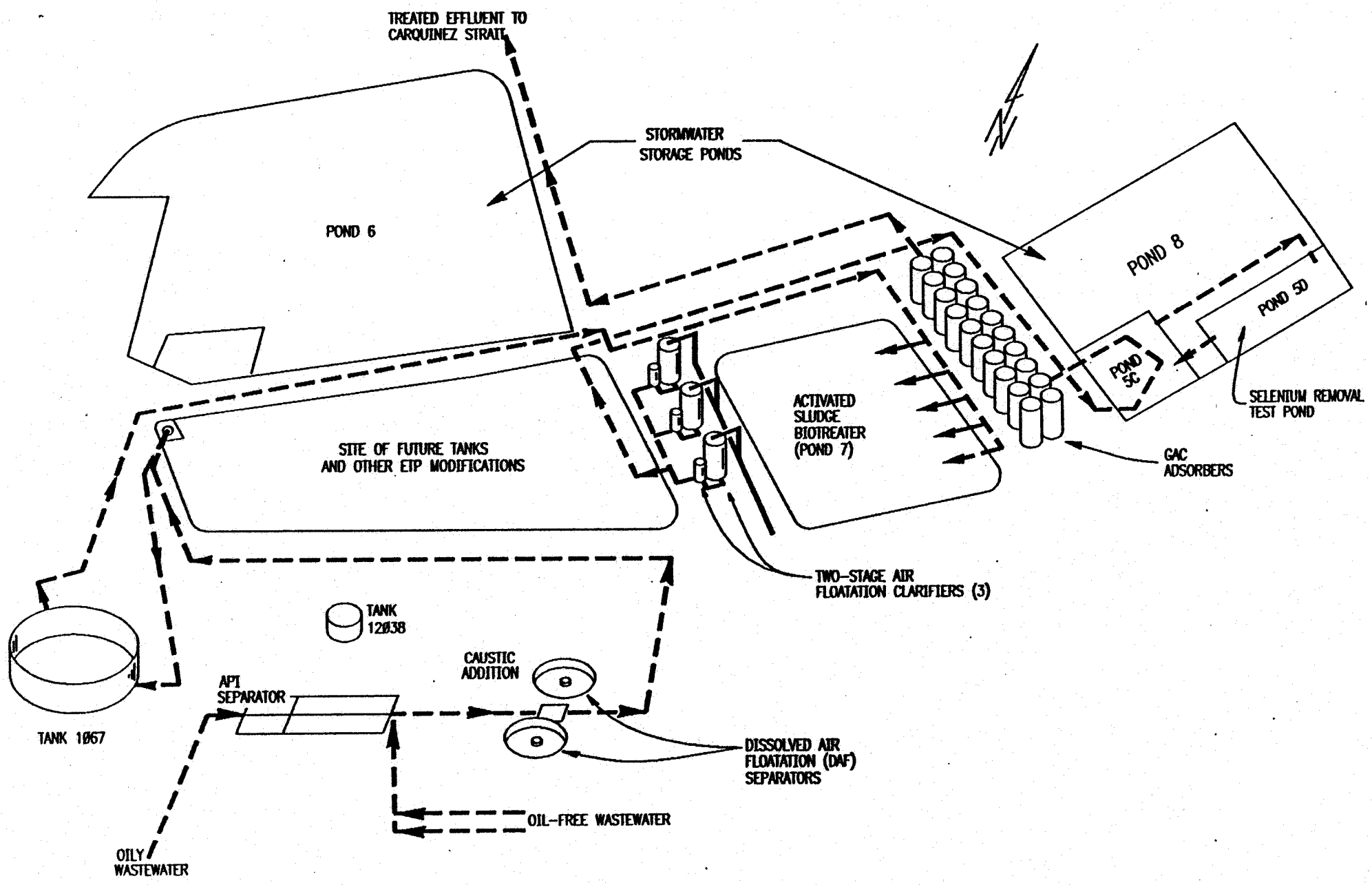

FIGURE 5
EFFLUENT TREATMENT POND LOCATION MAP

APPENDIX I

SELF-MONITORING AND REPORTING PROGRAM

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

SELF-MONITORING AND REPORTING PROGRAM

FOR

SHELL OIL COMPANY
MARTINEZ MANUFACTURING FACILITY
MARTINEZ, CONTRA COSTA COUNTY

ORDER NO. 95-234

CONSISTS OF

PARTS I, and II

PART I

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16. This Self Monitoring and Reporting Program (SM&RP), is issued in accordance with Provision D.40 of Regional Board Order No. 95-234.

The principal purposes of a SM&RP are; (1) to document compliance with waste discharge requirements and prohibitions established by the Board, (2) to facilitate the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of standards of performance, and (4) to assist the Discharger in complying with the requirements of Article 5, Chapter 15. Under no circumstances is the SM&RP to serve as a substitute document to the detailed requirements of Chapter 15.

Based upon the Findings of this Order, the Discharger shall implement corrective action measures as required, and shall demonstrate the effectiveness of the corrective action measures through a water quality monitoring program, consistent with the Corrective Action Program of Article 5, Chapter 15, Section 2550.10.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analysis shall be performed according to the most recent version of Standard USEPA Methods, and in accordance with an approved sampling and analysis plan. Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. Specific methods of analysis must be identified. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Executive Officer prior to use. The director of the laboratory, or the director's designatee, shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements. In addition, the Discharger is responsible for seeing that the laboratory analysis of all samples from Monitoring Points meets the following restrictions:

1. The methods of analysis and the detection limits used must be appropriate for the expected concentrations.

2. "Trace" results -- results falling between the MDL and the Facility-specific practical quantitation limit [PQL] -- shall be reported as such, and shall be accompanied both by the estimated MDL and PQL values for that analytical run and by an estimate of the constituent's concentration.

3. MDLs and PQLs shall be derived by the laboratory for each analytical procedure, according to the State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific analytical procedure and equipment used by the lab, rather than simply being quoted from USEPA analytical method manuals. If the lab suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with an estimate of the detection limit and quantitation limit actually achieved.

4. All QA/QC data shall be reported, along with the sample results to which it applies, including the method, equipment, and analytical detection limits, the recovery rates, an explanation for any recovery rate that is less than 80% or greater than 120%, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses Sample results shall be reported unadjusted for blank results or spike recovery.

5. Procedures for determining the significance of analytical results need not be performed for common laboratory contaminants (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate). Nevertheless, analytical results involving detection of these analytes in any background or downgradient sample shall be reported and flagged for easy reference by Board staff.

6. In cases where contaminants are detected in QA/QC samples [i.e., field, trip, or lab blanks], the accompanying sample results shall be appropriately reported.

7. The MDL shall always be calculated such that it represents a concentration associated with a 99% reliability of a non-zero result.

C. DEFINITION OF TERMS

1. The **"Monitored Media"** are those water- or gas-bearing media that are monitored pursuant to this Self Monitoring and Reporting Program. The Monitored Media may include: **(1)** ground water in the uppermost aquifer, in any other portion of the zone of saturation [§2601 of Chapter 15] in which it would be reasonable to anticipate that waste constituents migrating from a waste unit could be detected, and in any perched zones along the Perimeter Compliance Point or at the unit, **(2)** any bodies of surface water that could be measurably affected by a release, **(3)** soil pore liquid beneath and/or adjacent to the Perimeter Compliance Point or unit, and **(4)** soil pore gas beneath and/or adjacent to the Perimeter Compliance Point or Unit.

2. The **"Constituents of Concern [COC]"** are those constituents which are likely to be in a waste management unit or which are likely to be derived from waste constituents, in the event of a release. The Constituents of Concern for the Perimeter Compliance Point shall be defined in this appendix.

3. **"Trigger Limits"** For each unit's COCs, (allowable concentration limits) shall be set at the Perimeter Compliance Point.

4. The **"Monitoring Parameters"** are a subset of the COCs and are parameters used for the majority of monitoring activity. The Monitoring Parameters for each unit shall be listed in this appendix. Monitoring Parameters are used to indicate leakage from the Facility's units beyond the Perimeter Compliance Point and at the unit. During a corrective action period, monitoring parameters provide a means to evaluate the effectiveness of the corrective action.

5. **"Standard Observations"** refers to:
   a) For potential receiving waters (Carquinez Strait and Contiguous Marsh/Wetlands);
      1) Floating and suspended materials of waste origin: presence or absence, source, and size of affected area;
      2) Discoloration and turbidity: description of color, source, and size of affected area;
      3) Evidence of odors: presence or absence, characterization, source, and distance of travel from source;
      4) Evidence of beneficial use: presence of water-associated wildlife;
      5) Flow rate; and
      6) Weather conditions: wind direction and estimated velocity, total precipitation during the previous five days and on the day of observation;

   b) Along the perimeter of any waste management unit:
      1) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
      2) Evidence of odors: presence or absence, characterization, source, and distance of travel from source; and
      3) Evidence of erosion and/or of daylighted waste.

   c) For any solid waste management unit:
      1) Evidence of ponded water at any point on the waste management unit (show affected area on map);
      2) Evidence of odors: presence or absence, characterization, source, and distance of travel from source; and
      3) Evidence of erosion and/or of daylighted contaminated materials

6. **"Standard Analysis and Measurements"** refers to:
   a) Turbidity [only for water samples], in NTU;
   b) Water elevation to the nearest 1/100th foot above mean sea level [only for ground water monitoring]; and
   c) Sampling and analysis of the **Monitoring Parameters.**

7. **"Matrix Effect"** refers to any increase in the Method Detection Limit or Practical Quantitation Limit for a given constituent as a result of the presence of other constituents -- either of natural origin or introduced through a release -- that are present in the sample of water.

8. **"Method Detection Limit [MDL]"**, for a given analytical laboratory using a given analytical method to detect a given constituent [in spite of any Matrix Effect] **means** the lowest concentration at which the laboratory can regularly differentiate -- with 99% reliability -- between a sample which contains the constituent and one which does not.

9. **"Practical Quantitation Limit [PQL]"**, for a given analytical laboratory using a given analytical method to determine the concentration of a given constituent [in spite of any Matrix Effect] **means** the lowest constituent concentration the laboratory can regularly quantify within specified limits of precision that are acceptable to the Regional Board Executive Officer. The PQL shall reflect the Quantitation capabilities of the specific analytical procedure and equipment used by the laboratory. PQLs reported by the laboratory shall not simply be restated from USEPA analytical method manuals. In relatively interference-free water, laboratory derived PQLs are expected to closely agree with published USEPA PQLs. If the lab suspects that, due to matrix or other effects, the quantitation limit for a particular analytical run differs significantly from the laboratory- derived PQL, the results shall be flagged accordingly, along with an estimate of the detection limit achieved.

10. **"Sample & Analysis Period"** means the duration separating sampling and analysis events from monitoring points or wells, for a given type of monitoring from the time the next iteration of that event. Unless otherwise specified in this SM&RP, the period for sampling and analysis for the COCs (without four quarters of data) is quarterly for the first four quarters, and then once every five years thereafter. After one year, Monitoring Parameters will be determined and will be sampled on a quarterly basis. The Discharger may request a reduction of sampling frequency after the first year of quarterly Monitoring Parameter data is collected.

11. **"Sample & Analysis Event"** means the point in time that sampling and analysis is performed from monitoring points or wells, for a given type of monitoring. Unless otherwise specified in this SM&RP, the sampling and analysis for the Monitoring Parameters will be quarterly, and the sampling and analysis of all Constituents of Concern will be during the 4th quarter Sampling and Analysis Period.

12. **"Reporting Period"** means the duration separating the submittal of a monitoring report from the time the next iteration of that report is scheduled for submittal. Unless otherwise specified in this SM&RP, the reporting period of the results of the sampling and analysis period is 6 months. The Reporting Period for the Annual Summary Report extends from January 1 of the current year to December 31 of the current year. The due date for any given report will be 60 days after the end of its Reporting Period, unless otherwise stated.

13. **"Receiving Waters"** refers to any surface water which actually or potentially receives surface or ground waters which pass over, through, or under waste materials or contaminated soils. In this case the following surface water bodies are considered receiving waters: The local groundwaters beyond the Perimeter Compliance Point, marsh/wetlands and the Carquinez Strait .

D. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the Discharger or laboratory, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

1. Identity of sample and of the Monitoring Point from which it was taken, along with the identity of the individual who obtained the sample;

2. Date and time of sampling;

3. Date that analyses were started and completed, and the name of the personnel performing each analysis;

4. Complete procedure used, including method of preserving the sample, and the identity of reagents used;

5. Calculation of results; and,

6. Results of analyses, and the MDL and PQL for each analysis.

E. REPORTS TO BE FILED WITH THE BOARD

1. A written **Semiannual Monitoring Report** for the waste management units and the Perimeter Compliance Point shall be submitted semiannually. The second semiannual Monitoring Report will contain the "**Annual Summary Report**". The reports shall be comprised of at least the following:

a. **Letter of Transmittal**

A letter transmitting the essential points in each report shall accompany each report. Such a letter shall include a discussion of any requirement violations found since the last such report was submitted, and shall describe actions taken or planned for correcting those violations. If the Discharger has previously submitted a detailed time schedule for correcting said requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred since the last submittal, this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting the monitoring reports shall be signed by a principal executive officer at the level of vice president or above, or by his/her duly authorized representative, if such representative is responsible for the overall operation of the Facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct;

b. Each Monitoring Report shall include a compliance evaluation summary. The summary shall contain at least:

1) **Semiannual Groundwater Flow and Direction:** For each monitored ground water body, a description and graphical presentation of the velocity and direction of ground water flow, based upon water level elevations taken during the collection of the water quality data submitted in the semiannual report;

2) **Sampling:** For each Monitoring Point addressed by the report, a description of the type of pump -- or other device -- used and its placement for sampling, and a detailed description of the sampling procedure [number and description of the samples, field blanks, travel blanks, and duplicate samples taken, the type of containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations];

3) **Groundwater Quality Analysis:** Tabular and graphical summaries of the monitoring data obtained during the previous event with historical summary. Evaluation of groundwater analysis including data analysis and determination of compliance with the Trigger Levels.

4) **Laboratory Statements**: For each Monitoring report include laboratory statements of results of all analysis demonstrating compliance with Part I.B.

5) **Compliance Record**: A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the Order requirements.

6) **Computer Data**: All monitoring analytical data obtained during the monitoring event, shall be presented in tabular form as well as on a 3½" or 5¼" diskettes, either in MS-DOS/ASCII format or in another file format acceptable to the Executive Officer. Data sets too large to fit on a single 360KB/720KB or 1.2MB/1.4MB diskette may be submitted on disk in a commonly available compressed format [e.g., FASTBACK or NORTON BACKUP, etc.]. The Board regards the submittal of data in hard copy and on diskette as "...the form necessary for..." statistical analysis, in that this facilitates any review by the Board's statistical consultant.

c. A map or aerial photograph showing the locations of observation stations and Monitoring Points;

d. An evaluation of the effectiveness of the run-off/run-on control facilities; and

e. A summary and certification of completion of all Standard Observations [Part I.C.5.] for each unit, the perimeter of each unit, and for the Receiving Waters.

2. **CONTINGENCY REPORTING**

a. The Discharger shall report by telephone, immediately after it is discovered, evidence of a significant release at the point of compliance or at a unit, that may pose a threat to surface or subsurface waters of the State. A written report shall be filed with the Board within seven days, containing at least the following information:
   1) A map showing the location(s) of release;
   2) An estimate of the flow rate;
   3) A description of the nature of the discharge (e.g., all pertinent observations and analyses); and
   4) corrective measures underway or proposed.

b. Should the monitoring data indicate, for any Constituent of Concern or Monitoring Parameter, that the Trigger Levels at the Perimeter Compliance Point have been exceeded, the Discharger shall immediately notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within seven days of such determination, and shall carry out the requirements of Part I.E.2.c. (below) In any case, the Discharger shall inform the Regional Board of the outcome of the retest as soon as the results are available, following up with written results submitted by certified mail within seven days of completing the retest. If resampling and analysis indicate that any COC or Monitoring Parameter is above the Trigger Levels, the Discharger shall prepare a Corrective Action Plan for approval by the Executive Officer.
PLAN DUE DATE: Within 120 days of confirmation of exceedance of Trigger Levels.

c. If the Discharger concludes that Trigger Levels have been exceeded at the Perimeter Compliance Point, has occurred: Then the Discharger shall, within thirty days, sample for all Constituents of Concern at all immediately adjacent Monitoring Points and submit them for laboratory analysis. Within seven days of receiving the laboratory analytical results, the Discharger shall notify the Regional Board, by certified mail, of the concentration of all Constituents of Concern at each Monitoring Point. Because this scan is not to be tested against background, only a single datum is required for each Constituent of Concern at each Monitoring Point [§2550.8(k)(1)];

d. If it is determined that a waste management unit is an ongoing source of pollution which is likely to degrade State waters, the Discharger shall immediately notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written

notification by certified mail within seven days of such determination.

3. **ANNUAL SUMMARY REPORT**

The Discharger shall submit an annual report to the Board covering the previous monitoring year. The Reporting Period ends March 31. This report shall contain:

a. **A Graphical Presentation of Analytical Data [§2550.7(e)(14) of Article 5].** For each Monitoring Point, submit in graphical format the laboratory analytical data for all samples taken on a quarterly frequency. Each such graph shall plot the concentration of one or more constituents over time for a given Monitoring Point, at a scale appropriate to show trends or variations in water quality. All graphs for a given constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. On the basis of any aberrations noted in the plotted data, the Executive Officer may direct the Discharger to carry out a preliminary investigation [§2510(d)(2)], the results of which will determine whether or not a release is indicated.

b. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

Part II: MONITORING AND OBSERVATION SCHEDULE

A. WATER SAMPLING/ANALYSIS FOR MONITORING

1. Thirty-Day Sample Procurement Limitation. For any given monitored medium, the samples taken from all Monitoring Points to satisfy the data analysis requirements for a given Reporting Period shall all be taken within a span not exceeding 30 days, and shall be taken in a manner that insures sample independence to the greatest extent feasible. Ground water sampling shall also include an accurate determination of the ground water surface elevation and field parameters [temperature, electrical conductivity, turbidity] for that Monitoring Point.

2. Monitoring Points For Each Monitored Medium: The Discharger shall sample Monitoring Points, in accordance with the most recent sampling schedule and constituent list given in Table 2.

3. Semi-annual Determination of Ground Water Flow Rate/Direction : The Discharger shall measure the water level in each well and determine ground water flow rate and direction in each groundwater body at least semiannually, including the times of expected highest and lowest elevations of the water level for the respective ground water body. This information shall be included in the twice-yearly monitoring reports required under Part I. The Discharger shall identify the presence of separate-phase hydrocarbons found at any monitoring point.

4. "Direct Monitoring" of All Constituents of Concern . In the absence of a release being indicated **(1)** for a Monitoring Parameter, **(2)** based upon physical evidence, pursuant to Part I.E.2.c., or **(3)** by a study required by the Executive Officer based upon anomalies noted during visual inspection of graphically-depicted analytical data [Part I.E.3.a.], **then** the Discharger shall sample all Monitoring Points for water-bearing media for all Constituents of Concern every fifth year, beginning with the year of the effective date of this Self Monitoring and Reporting Program. Successive direct monitoring efforts shall be carried out alternately during the fourth quarter Sampling and Analysis Period and every fifth year thereafter.

5. New Wells and New COCs:
   a. Whenever a new Constituent of Concern is identified, the Discharger shall collect at least one sample quarterly for at least one year in order to establish a Trigger Levels for the newly-added constituent(s); and

   b. Whenever a new Monitoring Point is added, including any added by this Order, the Discharger shall sample it at least quarterly for at least one year, analyzing for all Constituents of Concern and Monitoring Parameters.

I Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing Self Monitoring and Reporting Program:

1. Has been developed in accordance with the procedure set forth in the Board's Resolution 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 95-234

2. Is effective on the date shown below.

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice for the Executive Officer.

Loretta K. Barsamian

Loretta K. Barsamian, Executive Officer

Effective Date: December 13, 1995

TABLE 2

TRIGGER LIMITS FOR CERTAIN CONSTITUENT OF CONCERN FOR THE FACILITY'S PERIMETER COMPLIANCE POINT

Constituent Of Concern	Allowable Concentration (ug/l) unless otherwise noted	Reference	Analytical Method
TPH-Gas	1000	b	8015 MOD/5030
TPH-Diesel	1000	b	8015 MOD/3550
Dissolved Sulfide	100	b	376.2/9030
1,2 Dichlorobenzene	18 mg/l	a, b- (Human Health)	8020
1,3 Dichlorobenzene	2.6 mg/l	a, b - (Human Health)	8020
1,4 Dichlorobenzene	64	a, b - (Human Health)	8020
Bis(2-ethylhexyl)phthalate	9.9	c - (Human Health)	8270
2,4-Dimethylphenol	2300	c,d* - (Human Health)	8270
Phenanthrene	4.6	d - (Aquatic Life)	8270
Benzene	21	a - (Human Health)	8020
Toluene	5000	f	8020
Chloroform	480	b - (Human Health)	8010
Halomethanes (see definition below)	480	b - (Human Health)	8260
Organic Lead	27	e	CA LUFT Mod.7421
PAH (see definition below)	15	b	8270
Pentachlorophenol	7.9	a - (Aquatic Life)	8270
Total Phenolics	50	b	420.1
Arsenic	36	a,c - (Aquatic Life)	206.2
Antimony (trivalent)	500	d - (Aquatic Life)	6010/200.7
Beryllium	0.13	c- Human Health	**
Cadmium	10	e - (Aquatic Life)	6010/200.7
Chromium VI	11	f	7196
Copper	2.9	a ,c,d - (Aquatic Life)	**
Total Dissolved Lead	5.6	a ,b - (Aquatic Life)	**
Manganese	100	d - (Aquatic Life)	**
Mercury	0.025	f	245.1
Nickel	8.3	a, b - (Aquatic Life)	**
Selenium	5.0	a - (Aquatic Life)	270.2
Vanadium	170	a - (Aquatic Life)	6010/200.7
Zinc	86	a ,b- (Aquatic Life)	6010/200/7

*Slightly different value

** Method to be determined

1. REFERENCE LIST

a = San Francisco Bay Region Basin Plan
b = Chevron Richmond Refinery WDR Order No. 93-109
c = California Enclosed Bays and Estuaries Plan
d = A Compilation of Water Quality Goals- by Jon Marshack
e = Shell Oil Company - third quarter groundwater report
f = San Francisco International Airport SCR No. 95-136

2. DEFINITIONS

Halomethanes shall mean the sum of bromoform , bromomethane, methyl bromide, methyl chloride, chlorodibromomethane, and dichlorobromomethane.

PAHs (Polynuclear Aromatic Hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene

3. FREQUENCY OF MONITORING FOR ALL WASTE MANAGEMENT UNITS

a. Monitoring Parameters Quarterly sampling
b. Constituents of Concern List Upon adoption of Order and every five years thereafter.

4. Table 2 does not apply to the Crude Hill Groundwater Basin. Trigger Limits for the Crude Hill Groundwater Basin shall be based on Maximum Concentration Limits.

5. Table 2 may be modified at any time with Executive Officer approval.